TYPE OR PRINT
IN BLACK INK
(For instructions, see booklet: "How to File an Application to Appropriate Water in California")

California Environmental Protection Agency

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
www.waterboards.ca.gov/waterrights

APPLICATION NO. 31836

APPLICATION TO APPROPRIATE WATER

1. APPLICANT/AGENT

	APPLICANT	ASSIGNED AGENT (if any)
Name	Harry and Karen Bosworth	
Mailing Address	P.O. Box 65	
City, State & Zip	Geyserville, CA 95448	
Telephone	707 857-3463	
Fax	707 857-3163	
E-mail	harry@bosworthandson.com	

2. OWNERSHIP INFORMATION (Please check type of ownership.)

☐ Sole Owner ☐ Limited Liability Company (LLC) ☐ General Partnership*
☐ Limited Partnership* ☐ Business Trust ☑ Husband/Wife Co-Ownership
☐ Corporation ☐ Joint Venture ☐ Other _____

*Please identify the names, addresses and phone numbers of all partners.

3. PROJECT DESCRIPTION (Provide a detailed description of your project, including, but not limited to, type of construction activity, area to be graded or excavated, and how the water will be used.) Add additional pages if needed and check box below and label as an attachment.

Existing 8.55 acre-feet capacity reservoir constructed on seasonal surface channel. Reservoir collects surfcae water runoff from 13-acre drainage area during the wet weather season and groundwater from an adjacent irrigation well. Stored water is used to irrigate 15 acres of vineyard, provide water for livestock and support fishing, swimming and boating recreational activities.

☐ *For continuation, see Attachment No. ___*

Rec'd $1,000.00 $850.00 6/29

4. PURPOSE OF USE, DIVERSION/STORAGE AMOUNT AND SEASON

a. PURPOSE OF USE (irrigation, domestic, etc.)	DIRECT DIVERSION				STORAGE		
	AMOUNT		SEASON OF DIVERSION		AMOUNT	SEASON OF COLLECTION	
	Rate (cfs or gpd)*	Acre-feet per annum	Beginning date (month & day)	Ending date (month & day)	Acre-feet per annum	Beginning date (month & day)	Ending date (month & day)
Irrigation					4.46	Dec 15	March 31
Stock watering					0.06	Dec 15	March 31
Recreation					4.03	Dec 15	March 31
	Total afa			Total afa	8.55		

☐ *See Attachment No.* ___ * If rate is less than 0.025 cubic feet per second (cfs), use gallons per day (gpd).

b. Total combined amount taken by direct diversion and storage during any one year will be 8.55 acre-feet.

c. Reservoir storage is: ☑ onstream ☐ offstream ☐ underground (If underground storage, attach Underground Storage Form.)

d. County in which diversion is located: Sonoma County County in which water will be used: Sonoma County

5. SOURCES AND POINTS OF DIVERSION/REDIVERSION

a. Sources and Points of Diversion (POD)/Points of Rediversion (PORD):

☑ POD / ☐ PORD # Unnamed Stream tributary to Unnamed Stream thence Russian River

☐ POD / ☐ PORD # _____ tributary to _____ thence _____

☐ POD / ☐ PORD # _____ tributary to _____ thence _____

☐ POD / ☐ PORD # _____ tributary to _____ thence _____

If needed, attach additional pages, check box below and label attachment

☐ *See Attachment No.* ___

b. State Planar and Public Land Survey Coordinate Description:

POD/ PORD #	CALIFORNIA COORDINATES (NAD 83)	ZONE	POINT IS WITHIN (40-acre subdivision)	SECTION	TOWN-SHIP	RANGE	BASE AND MERIDIAN
1	N 386,673 E1,748,293	2	SE ¼ of SW ¼	8	10N	9W	MD
			¼ of ¼				
			¼ of ¼				
			¼ of ¼				

If needed, attach additional pages, check box below and label attachment

☐ *See Attachment No.* ___

c. Name of the post office most often used by those living near the proposed point(s) of diversion: Geyserville

6. WATER AVAILABILITY

a. Have you attached a water availability analysis for this project? ☑ YES ☐ NO
If NO, provide sufficient information to demonstrate that there is reasonable likelihood that unappropriated water is available for the proposed appropriation: If needed, attach additional pages, check box below and label attachment.

☐ *See Attachment No.* ___

b. Is your project located on a stream system declared to be fully appropriated by the State Water Resources Control Board (State Water Board) during your proposed season of diversion?
☐ YES ☑ NO

c. In an average year, does the stream dry up at any point downstream of your project? ☑ YES ☐ NO
If YES, during which months? ☐ Jan ☐ Feb ☐ Mar ☑ Apr ☑ May ☑ Jun ☑ Jul ☑ Aug ☑ Sep ☑ Oct ☑ Nov ☐ Dec

d. What alternate sources of water are available if a portion of your requested diversion season must be excluded because water is not available for appropriation? (e.g., percolating groundwater, purchased water, etc.) If needed, attach additional pages, check box below and label attachment
Well water
☐ *See Attachment No.* 1

7. PLACE OF USE

a.

USE IS WITHIN (40-acre subdivision)	SECTION*	TOWNSHIP	RANGE	BASE & MERIDIAN	IF IRRIGATED	
					Acres	Presently cultivated?
SE ¼ of SW¼	8	10N	9W	MD	9.5	☑ YES ☐ NO
SW ¼ of SE ¼	8	10N	9W	MD	3.5	☑ YES ☐ NO
NE ¼ of NW ¼	17	10N	9W	MD	2	☑ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
¼ of ¼						☐ YES ☐ NO
				Total Acres:	15	

*Please indicate if section is projected with a "(P)" following the section number.

☐ *See Attachment No.* ___ Please provide the Assessor's Parcel Number(s) for the place of use:
141-170-009

8. PROJECT SCHEDULE

Project is: ☐ proposed, ☐ partially complete or ☑ complete (Year completed - 2000).

Extent of completion: Fully Completed

Estimated amount of time in years it will take for construction to be completed: ___

Estimated amount of time in years it will take for water to be put to full beneficial use: ___

9. JUSTIFICATION OF AMOUNTS REQUESTED

a. ☑ IRRIGATION: Maximum area to be irrigated in any one year: 15 acres.

CROP	ACRES	METHOD OF IRRIGATION (sprinklers, flooding, etc.)	WATER USE (Acre-feet/Yr.)	SEASON OF WATER USE	
				Beginning date (month & day)	Ending date (month & day)
Vineyard/grapes	15	Drip irrigation	4.46	June 1	Sept 30

☐ *See Attachment No. ___*

b. ☐ DOMESTIC: Number of residences to be served: _____ Separately owned? ☐ YES ☐ NO Number of people to be served: _____ Estimated daily use per person is: _____ gallons per day Area of domestic lawns and gardens: _____ square feet
Incidental domestic uses:

_____
(dust control area, number and kind of domestic animals, etc.)

a. ☑ STOCKWATERING: Kind of stock: Cows Maximum number: 10
Describe type of operation: Range
(feedlot, dairy, range, etc.)

d. ☑ RECREATIONAL: Type of recreation: ☑ Fishing ☑ Swimming ☐ Boating ☐ Other _____

e. ☐ MUNICIPAL:

POPULATION List for 5-year periods until use is completed		MAXIMUM MONTH		ANNUAL USE		
Period	Population	Average daily use (gallons per capita)	Rate of diversion (cfs)	Average daily use (gallons per capita)	Acre-foot (per capita)	Total (acre-feet)
Present						

☐ *See Attachment No. ___*

Month of maximum use during year: _____
Month of minimum use during year: _____

f. ☐ HEAT CONTROL: Area to be heat controlled: _____ net acres
Type of crops protected: _____
Rate at which water is applied to use: _____ gpm per acre
Heat protection season will begin _____ and end _____.
(month and day) (month and day)

g. ☐ FROST PROTECTION: Area to be frost protected: _____ net acres
Type of crops protected: _____
Rate at which water is applied to use: _____ gpm per acre
The frost protection season will begin _____ and end _____.
(month & day) (month & day)

h. ☐ INDUSTRIAL: Type of industry: _____

Basis for determination of amount of water needed: _____

i. ☐ MINING: Name of the claim: _____ ☐ Patented ☐ Unpatented
Nature of the mine: _____ Mineral(s) to be mined: _____
Type of milling or processing: _____
After use, the water will be discharged into _____ (watercourse)
in _____ ¼ of _____ ¼ of Section _____, T _____, R _____, _____B. & M.

j. ☐ POWER: Total head to be utilized: _____ feet
Maximum flow through the penstock: _____ cfs Maximum theoretical horsepower capable of being generated by the works (cfs x fall ÷ 8.8): _____
Electrical capacity (hp x 0.746 x efficiency): _____ kilowatts at: _____% efficiency
After use, the water will be discharged into _____ (watercourse)
in _____ ¼ of _____ ¼ of Section _____, T _____, R _____, _____B&M. FERC No.:_____

k. ☐ FISH AND WILDLIFE PRESERVATION AND/OR ENHANCEMENT: List specific species and habitat type that will be preserved or enhanced: _____

l. ☐ OTHER: Describe use: _____
Basis for determination of amount of water needed: _____

10. DIVERSION AND DISTRIBUTION METHOD

a. Diversion will be by gravity by means of: Dam
(dam, pipe in unobstructed channel, pipe through dam, siphon, weir, gate, etc.)

b. Diversion will be by pumping from: _____
(sump, offset well, channel, reservoir, etc)
Pump discharge rate: _____ ☐ cfs or ☐ gpd Horsepower: _____
Pump Efficiency: _____

c. Conduit from diversion point to first lateral or to offstream storage reservoir:

CONDUIT (pipe or channel)	MATERIAL (type of pipe or channel lining; indicate if pipe is buried or not)	CROSS-SECTION (pipe diameter, or ditch depth and top and bottom width) (inches or feet)	LENGTH (feet)	TOTAL LIFT OR FALL		CAPACITY (cfs, gpd or gpm)
				feet	+ or -	
N/A						

☐ *See Attachment No. ___*

d. Storage reservoirs: (For underground storage, complete and attach underground storage form)

RESERVOIR NAME OR NUMBER	DAM				RESERVOIR		
	Vertical height from downstream toe of slope to spillway level (feet)	Construction material	Length (feet)	Freeboard: dam height above spillway crest (feet)	Surface area when full (acres)	Capacity (acre-feet)	Maximum water depth (feet)
1	38	Earth	180	2.7	0.56	8.55	22

☐ *See Attachment No. ___*

e. Outlet pipe: Complete for storage reservoirs having a capacity of 10 acre-feet or more.

RESERVOIR NAME OR NUMBER	OUTLET PIPE				
	Diameter in inches	Length in feet	Fall: Vertical distance between entrance and exit of outlet pipe in feet	Head: Vertical distance from spillway to entrance of outlet pipe in feet	Dead Storage: Storage below entrance of outlet pipe in acre-feet
N/A					

☐ *See Attachment No. ___*

e. If water will be stored and the reservoir is not at the point of diversion, the maximum rate of diversion to off-stream storage will be _____ cfs. Diversion to offstream storage will be made by:
☐ Pumping ☐ Gravity

11. CONSERVATION AND MONITORING

a. What methods will you use to conserve water? Explain.
Drip irrigation is used in vineyard. Water is used at agronomic rates using irrigation scheduling and vineyard management.

b. How will you monitor your diversion to be sure you are within the limits of your water right and you are not wasting water? ☐ Weir ☐ Meter ☐ Periodic sampling ☐ Other (describe)
Storage capacity matches requested water right

12. RIGHT OF ACCESS

a. Does the applicant own all the land where the water will be diverted, transported and used?
☑ YES ☐ NO
If NO, I ☐ do ☐ do not have a recorded easement or written authorization allowing me access.

b. List the names and mailing addresses of all affected landowners and state what steps are being taken to obtain access:

☐ *See Attachment No. ___*

13. EXISTING WATER RIGHTS AND RELATED FILINGS

a. Do you claim an existing right for the use of all or part of the water sought by this application?
☐ YES ☑ NO
If YES, please specify: ☐ Riparian ☐ Pre-1914 ☐ Registration ☐ Permit ☐ License
☐ Percolating groundwater ☐ Adjudicated ☐ Other (specify) _____

b. For each existing right claimed, state the source, year of first use, purpose, season and location of the point of diversion (to within quarter-quarter section). Include number of registration, permit, license, or statement of water diversion and use, if applicable.

☐ *See Attachment No. ___*

c. List any related applications, registrations, permits, or licenses located in the proposed place of use or that utilize the same point(s) of diversion.

☐ *See Attachment No. ___*

14. OTHER SOURCES OF WATER

Are you presently using, or do you intend to use, purchased water or water supplied by contract in connection with this project? ☐ Yes ☑ No If yes, please explain:

15. MAP REQUIREMENTS

The Division cannot process your application without accurate information showing the source of water and location of water use. You must include a map with this application form that clearly indicates the quarter/quarter, section, township, range, and meridian of (1) the proposed points of diversion and (2) the place of use. A copy of a U.S.G.S. quadrangle/topographic map of your project area is preferred, and can be obtained from sporting goods stores or through the Internet at http://topomaps.usgs.gov. A certified engineering map is required when (1) appropriating more than three cubic feet per second by direct diversion, (2) constructing a dam which will be under the jurisdiction of the Division of Safety of Dams, (3) creating a reservoir with a surface area in excess of ten acres or (4) appropriating more than 1,000 acre-feet per annum by underground storage. See the instruction booklet for more information.

☐ *See Attachment No.* 2

ENVIRONMENTAL INFORMATION

Note: Before a water right permit may be issued for your project, the State Water Board must consider the information contained in an environmental document prepared in compliance with the California Environmental Quality Act (CEQA). This form is not a CEQA document. If a CEQA document has not yet been prepared for your project, a determination must be made of who is responsible for its preparation. If the State Water Board is determined to be responsible for preparing the CEQA document, the applicant will be required to pay all costs associated with the environmental evaluation and preparation of the required documents. Please answer the following questions to the best of your ability and submit with this application any studies that have been conducted regarding the environmental evaluation of your project.

16. COUNTY PERMITS

a. Contact your county planning or public works department and provide the following information:

Person contacted: Nathan Quarles Date of contact: 2008

Department: Sonoma County Permit & Resource Management Department Telephone: (707) 565-2502

County Zoning Designation:

LIA (Land Intensive Agriculture District) B6 20 SR (Scenic Resource) VOH (Valley Oak Habitat)

Are any county permits required for your project? ☐ YES ☑ NO If YES, check appropriate box below:

☐ Grading permit ☐ Use permit ☐ Watercourse ☐ Obstruction permit ☐ Change of zoning ☐ General plan change ☐ Other (explain):

b. Have you obtained any of the required permits described above? ☐ YES ☐ NO
If YES, provide a complete copy of each permit obtained.

☐ *See Attachment No. ___*

17. STATE/FEDERAL PERMITS AND REQUIREMENTS

a. Check any additional state or federal permits required for your project:
☐ Federal Energy Regulatory Commission ☐ U.S. Forest Service ☐ U.S. Bureau of Land Management ☐ U.S. Corps of Engineers ☐ U.S. Natural Res. Conservation Service ☐ Calif. Dept. of Fish and Game ☐ State Lands Commission ☐ Calif. Dept. of Water Resources (Div. of Safety of Dams) ☐ Calif. Coastal Commission ☐ State Reclamation Board ☐ Other (specify)

_____

b. For each agency from which a permit is required, provide the following information:

AGENCY	PERMIT TYPE	PERSON(S) CONTACTED	CONTACT DATE	TELEPHONE NO.

☐ *See Attachment No. ___*

c. Does your proposed project involve any construction or grading-related activity that has significantly altered or would significantly alter the bed, bank, or riparian habitat of any stream or lake? ☐ YES ☑ NO
If YES, explain:

_____
_____
_____
_____
_____
_____

☐ *See Attachment No. ___*

b. Have you contacted the California Department of Fish and Game concerning your project?
☐ YES ☑ NO If YES, name, telephone number and date of contact:

_____

18. ENVIRONMENTAL DOCUMENT

a. Has any California public agency prepared an environmental document for your project?
☐ YES ☑ NO

b. If YES, submit a copy of the latest environmental document(s) prepared, including a copy of the notice of determination adopted by the California public agency. Public agency:

_____

c. If NO, check the appropriate box and explain below, if necessary:
☐ The applicant is a California public agency and will be preparing the environmental document.*
☑ I expect that the State Water Board will be preparing the environmental document.**
☐ I expect that a California public agency other than the State Water Board will be preparing the environmental document.* Public agency: _____
☐ *See Attachment No. ___*

* Note: When completed, submit a copy of the final environmental document (including notice of determination) or notice of exemption to the State Water Board, Division of Water Rights and proof of payment of the State Clearinghouse filing fee. Processing of your application cannot be completed until these documents are submitted.

** Note: CEQA requires that the State Water Board, as Lead Agency, prepare the environmental document. The information contained in the environmental document must be developed by the applicant and at the applicant's expense under the direction of the State Water Board, Division of Water Rights.

19. WASTE/WASTEWATER

a. Will your project, during construction or operation, (1) generate waste or wastewater containing such things as sewage, industrial chemicals, metals, or agricultural chemicals, or (2) cause erosion, turbidity or sedimentation? ☐ YES ☑ NO
If YES, or you are unsure of your answer, explain below and contact your local Regional Water Quality Control Board for the following information (See instruction booklet for address and telephone no.):

_____
_____
_____

☐ *See Attachment No.* ___

b. Will a waste discharge permit be required for your project? ☐ YES ☑ NO
Person contacted: _____ Date of contact: _____

c. What method of treatment and disposal will be used? _____
_____
_____

☐ *See Attachment No.* ___

20. ARCHEOLOGY

a. Have any archeological reports been prepared on this project? ☐ YES ☑ NO
b. Will you be preparing an archeological report to satisfy another public agency? ☐ YES ☑ NO
c. Do you know of any archeological or historic sites located within the general project area? ☐ YES ☑ NO If YES, explain:

_____
_____
_____

☐ *See Attachment No.* ___

21. ENVIRONMENTAL SETTING

Attach **two complete sets of color photographs**, clearly dated and labeled, showing the vegetation that exists at the following three locations:

☑ Along the stream channel immediately downstream from the proposed point(s) of diversion.
☑ Along the stream channel immediately upstream from the proposed point(s) of diversion.
☑ At the place(s) where the water is to be used.
☐ *See Attachment No.* 3

SUBMITTAL FEES

Calculate your application filing fee using the "Water Right Fee Schedule Summary" that was enclosed in the application packet. The "Water Right Fee Schedule Summary" can also be viewed at the Division of Water Rights' website (www.waterrights.ca.gov).

A check for the application filing fee, payable to the "Division of Water Rights" and an $850 check for the Streamflow Protection Standards review fee [Pub. Resources Code § 10005(a)], payable to the "California Department of Fish and Game," must accompany this application. All applicable fees are required at the time of filing. If the application fees are not received, your application will not be accepted and will be returned to you. Please check the fee schedule for any fee changes prior to submitting the application.

DECLARATION AND SIGNATURE

I declare under penalty of perjury that all information provided is true and correct to the best of my knowledge and belief. I authorize my agent, if I have designated one above, to act on my behalf regarding this water right application.

Signature of Applicant	Title or Relationship	Date
	OWNER	6-28-10
Signature of Co-Applicant (if any)	Title or Relationship	Date
	WIFE	6-28-10

Applications that are not completely filled out and/or do not have the appropriate fees will not be accepted. In the event that the Division has to return the application because it is incomplete, a portion of the application submittal fee will be charged for the initial review.

"APPLICATION TO APPROPRIATE WATER" CHECKLIST

Before you submit your application, be sure to:

- ☑ **Answer each question completely.**
- ☑ **Number, label and include all necessary attachments.**
- ☑ **Include a legible map that meets the requirements discussed in the instruction booklet.**
- ☑ **Include the Water Availability Analysis or sufficient information to demonstrate that there is reasonable likelihood that unappropriated water is available for the proposed appropriation.**
- ☑ **Include two complete sets of color photographs of the project site.**
- ☑ **Enclose a check for the required fee, payable to the Division of Water Rights.**
- ☑ **Enclose an $850 check for the Streamflow Protection Standards review fee, payable to the Department of Fish and Game.**
- ☑ **Sign and date the application.**

Send the original and one copy of the entire application to:

State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

Attachment 1

Water Availability Analysis

For Application to Appropriate Water for
Applicants Harry and Karen Bosworth

WAA/CFII REPORT

TO: Chief, Division of Water Rights, State Water Resources Control Board

FROM: Harry Bosworth

DATE: June 26, 2010

SUBJECT: WATER AVAILABILITY ANALYSIS (WAA) FOR APPLICATION OF HARRY AND KAREN BOSWORTH

1.0 INTRODUCTION

The purpose of this report is to summarize the results of the water availability analysis conducted for the subject application located within an unnamed ephemeral stream watershed in Sonoma County. The objectives of the analysis are as follows:

- To provide information required under California Water Code section 1275 (a), 1375 (d), 1243, 1243.5 and California Code of Regulations, Title 23, section 782, to demonstrate whether water is available for appropriation; and
- To determine the impact of the applications/project on streamflow in order to evaluate potential impacts to Public Trust Resources and provisions for compliance with various federal and state requirements. Examples include the California Environmental Quality Act (CEQA), the California Endangered Species Act (CESA), California Fish and Game Code and the federal Endangered Species Act (ESA).

2.0 PROJECT DESCRIPTION

Figures 1 and 2, (Attachment A and B) show the location of the unnamed stream watershed, the project's point(s) of diversion, and other features in the area. The project is located in Sonoma County approximately two miles northwest of the town of Geyserville. The application seeks to store 8.55 acre-feet (af) of water into an existing on-stream reservoir during the season of December 15th to March 31st Application *Harry and Karen Bosworth* requests diversion to storage for the purposes of vineyard irrigation, stock watering and recreational activities including fishing and swimming.

The 8.55 acre-feet reservoir is located on Sonoma County Assessor's Parcel Number 141-170-009. It was constructed in 2000 on an unnamed ephemeral surface water drainage channel. The unnamed channel is a tributary to an unnamed stream which is a tributary to the Russian River. The POD is located approximately 1.3 miles upstream of the confluence of the unnamed stream with the Russian River. The 1.3 mile stretch of channel is typically dry from mid-March through to mid-December.

An average of 4.46 af per annum of water is used to irrigate 15 acres of cabernet wine grapes; a maximum average of 0.06 af per annum is used to stock water 10

head of cattle; and the remaining 4.03 af per annum of water stored in the reservoir is utilized for recreational activities including fishing and swimming. Attachment C provides details on water use calculations.

Water used for vineyard irrigation is applied via drip irrigation lines at agronomic rates in accordance with a vineyard management irrigation schedule.

3.0 METHODS

The Rainfall-Runoff method was used to calculate run off in the project watershed in accordance with the following equation:

$$Q = C\ I\ A$$

Where: Q = Estimated average annual runoff (acre-feet per annum);
C = Runoff coefficient;
I = Average annual precipitation (feet per annum); and
A = Tributary watershed area (acres)

4.0 ANNUAL UNIMPAIRED FLOW

The contribution of water to the unnamed drainage channel would be primarily from surface water runoff occurring within the watershed located upstream of the project POD. To determine the amount of annual unimpaired flow the Rainfall-Runoff Method was utilized. Based on the use of this equation the annual unimpaired flow was determined to be 21.55 acre–feet per year.

4.1 Data and Assumptions

The only source of water contributing to the unnamed drainage channel, upstream of the POD, is surface water runoff.

The California Department of Transportation (Caltrans) Highway Design Manual table (See Attachment D) was used to determine the "C" value based on soil type, relief, vegetation and surface storage.

The average (mean) annual precipitation was taken from the Healdsburg, California Monthly Total Precipitation Table (1931 through 2008), found at the Western Regional Climate Center Website, http://www.wrcc.dri.edu/ (Attachment E).

The watershed area was calculated using GIS computer software. (See Attachment B for watershed boundary).

4.2 Calculations

Results:

C = 0.47
I = 3.51 feet/annum (42.14 inches/annum)
A = 13.06 acres

Q = 0.47 * 3.51 * 13.06
Q = 21.55 acre-feet/year

5.0 UNIMPAIRED FLOW DURING THE PROJECT'S DIVERSION SEASON

The projects diversion season is from December 15th through March 31st, during the wet weather season when run off is expected to occur. To determine the amount of diversion season unimpaired flow the Rainfall-Runoff Method was utilized. Based on the use of this equation the diversion season unimpaired flow was determined to be 15.35 acre–feet per diversion season.

5.1 Data and Assumptions

The only source of water contributing to the unnamed drainage channel, upstream of the POD, is surface water runoff.

The California Department of Transportation (Caltrans) Highway Design Manual table (See Attachment D) was used to determine the "C" value based on soil type, relief, vegetation and surface storage.

The average (mean) precipitation for the months of December, January, February and March (the Diversion Season) was taken from the Healdsburg, California Monthly Total Precipitation Table (1931 through 2008), found at the Western Regional Climate Center Website, http://www.wrcc.dri.edu/ (Attachment E).

The watershed area was calculated using GIS computer software. (See Attachment B for watershed boundary).

5.2 Calculations

Results:

C = 0.47
I = 2.50 feet/diversion season (29.97 inches/diversion season)
A = 13.06 acres

Q = 0.47 * 2.50 * 13.06
Q = 15.35 acre-feet/diversion season

6.0 BYPASS FLOW

There are no stream gages located on the ephemeral channel the POD is located on nor the ephemeral unnamed stream it is a tributary to. The Project POD is located at the beginning of the watershed and the only source of water in this area is surface water runoff collected from the 13 acre watershed. The Rainfall-Runoff Method was used to calculate the volume of water in acre-feet which would be collected during the months of October, November, December, January and February in order to determine the volume of water bypassing the POD as overflow from the reservoir during the month of February.

Results:

October = 1.15 acre feet
November = 2.68 acre feet
December = 4.20 acre feet
January = 4.56 acre feet
February = 3.79 acre feet

The Reservoir capacity is 8.55 acre feet. Upon reaching storage capacity excess water will overflow into the overflow culvert and on to the ephemeral stream channel.

If the reservoir were to be completely empty as of September 30th then 8.55 acre feet of water would be required to fill it. This would be achieved sometime in mid January according to the above calculated monthly water volumes.

If the reservoir were to contain the 4.03 acre feet of water, the amount allocated to recreational activities, then 4.52 acre feet of water would be required to fill it. This would be achieved sometime in mid December according to the above calculated monthly water volumes.

In either situation the reservoir would be filled by February 1st and any volume entering the watershed during the month of February would be expected to overflow the reservoir and enter the downstream ephemeral drainage channel. Please note that photos attached to the Appropriation Application were taken during the month of February and evidence the overflow of water from the reservoir.

According to the above calculations 3.79 acre feet of water would enter the watershed during the month of February when the reservoir is at storage capacity, resulting in a 0.068 cubic feet per second over flow rate.

7.0 CUMULATIVE FLOW IMPAIRMENT INDEX (CFII)

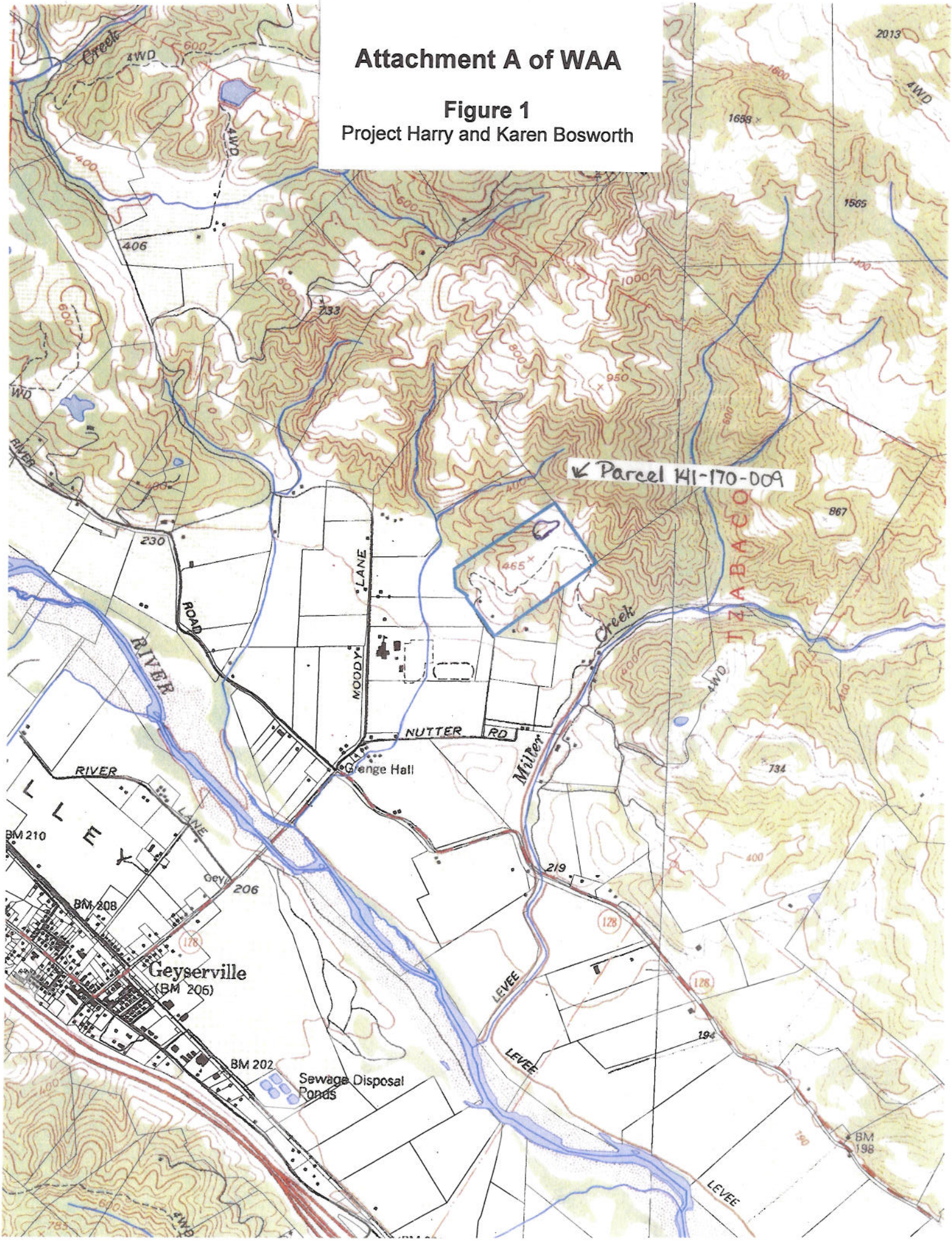
There are no known pending, junior or senior diverters within the watershed draining to and up gradient of the Project POD. There are no known pending, junior, or senior diverters within the watershed of the unnamed tributary to the Russian River, which the ephemeral channel the Reservoir is located on is a tributary to.

The State Water Resource Control Board 2009 eWRIMS database was consulted for entitlements on June 26, 2010.

Attachment A of WAA

Figure 1

Project Harry and Karen Bosworth



Attachment B of WAA

Figure 2

Project Harry and Karen Bosworth

Blue shaded area represents the up-gradient
13.06 acre watershed which drains to the reservoir.

Attachment C of WAA

WATER USE CALCULATIONS

Vineyard Use

807 vines/acre * 15 acres = 12,105 vines

12,105 vines * 2 gallons of water/vine/event = 24,210 gallons of water/event

24,210 gallons = 0.0743 acre-feet

60 events /year (2 months every day) * 0.0743 acre-feet of water/event = 4.458 acre-feet/year or 4.46 acre-feet/year

Stockwater Use

10 cows * 15 gallon of water/cow = 150 gallons

150 gallons of water/day * 120 days (4 months/year on property) = 18,000 gallons

18,000 gallons = 0.05524 acre-feet or 0.06 acre-feet/year

Recreation Use

8.55 acre-feet (total volume of reservoir) – 4.46 acre-feet – 0.06 acre-feet = 4.03 acre-feet/year

APPENDIX D of WAA

Runoff Coefficient for Undeveloped Areas

	Watershed Types			
	Extreme	High	Normal	Low
Relief	0.28 – 0.35 Steep, rugged terrain with average slopes above 30%	**0.20 – 0.28** **Hilly, with average slopes of 10 to 30%**	0.14 – 0.20 Rolling with average slope of 5 to 10%	0.08 – 0.14 Relatively flat land, with average slope of 0 to 5%
Soil Saturation	0.12 – 0.16 No effective soil cover; either rock or thin soil mantle of negligible infiltration capacity	0.08 – 0.12 Slow to take up water; clay or loam soil of low infiltration capacity; imperfectly or poorly drained	**0.06 – 0.08** **Normal; well-drained, high or medium-textured soils, sandy loams, silt and silty loams.**	0.04 – 0.06 High; deep sand or other soil that takes up water readily, very high level drained soils.
Vegetal Cover	0.12 – 0.16 No effective plant cover, bare, or very sparse cover	0.08 – 0.12 Poor to fair; clean cultivation crops, or poor natural cover, less than 20% of drainage area over good cover	**0.06 – 0.08** **Fair to good; about 50% of area in good grassland or woodland, not more than 50% of area in cultivated crops**	0.04 – 0.06 Good to excellent; about 90% of drainage area in good grassland, woodland or equivalent cover
Surface Storage	0.10 – 0.12 Negligible surface depression few and shallow; drainage ways steep and small, no marshes	**0.08 – 0.10** **Low; very well defined system of drainage ways; no ponds or marshes**	0.06 – 0.08 Normal; considerable surface depression storage, lakes and pond marshes	0.04 – 0.06 High; surface storage high; drainage system not sharply defined, large floodplain storage or large number of pond marshes

Project Harry & Karen Bosworth

Results:

1) Hilly terrain with average slope of 16%, — Relief = 0.24
2) Well-drained medium-textured silty loams, — Soil infiltration = 0.08
3) Majority grassy oak woodland smaller portion vineyard — Vegetal Cover = 0.06
4) Low, well-defined — Surface storage = 0.09

Find the runoff coefficient, C, for the above watershed.

C = 0.47

Reference Source: California Department of Transportation, *Highway Design Manual*, July 1, 1995, pp. 810-816.

Attachment E of WAA

HEALDSBURG, CALIFORNIA

Monthly Total Precipitation (inches)

(043875)

File last updated on Jul 24, 2006
*** Note *** Provisional Data *** After Year/Month 200603
a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value.
MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5
Individual Months not used for annual or monthly statistics if more than 5 days are missing.
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

YEAR(S)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1931	10.31	1.96	2.92	0.45	1.40	1.76	0.00	0.00	0.00	1.89	3.19	15.61	39.49
1932	3.07	1.91	1.14	1.71	1.83	0.03	0.00	0.00	0.00	0.05	2.60	4.81	17.15
1933	9.37	1.39	5.65	0.16	2.43	0.00	0.00	0.00	0.21	2.07	0.00	14.67	35.95
1934	1.42	8.14	1.20	0.92	1.57	1.12	0.00	0.00	0.08	4.07	7.17	3.71	29.40
1935	12.07	4.80	8.23	5.28	0.03	0.00	0.00	0.03	0.17	1.44	1.83	5.19	39.07
1936	8.59	13.54	1.76	2.58	1.05	1.34	0.12	0.00	0.00	0.27	0.03	4.48	33.76
1937	5.19	11.86	8.45	1.73	0.15	1.77	0.00	0.00	0.00	1.34	9.74	9.49	49.72
1938	8.14	13.47	10.67	2.79	0.03	0.00	0.01	0.00	0.41	2.74	2.55	1.85	42.66
1939	5.20	1.87	3.00	0.22	1.79	0.00	0.00	0.00	0.05	0.23	0.72	7.07	20.15
1940	17.12	20.68	7.07	1.88	1.84	0.00	0.02	0.00	0.42	2.85	3.15	21.35	76.38
1941	15.15	12.70	6.89	7.60	1.82	0.60	0.00	0.04	0.04	2.54	5.14	12.38	64.90
1942	10.42	10.11	4.01	7.05	3.12	0.00	0.00	0.00	0.10	1.20	5.49	7.52	49.02
1943	13.29	3.54	3.75	3.67	0.00	0.01	0.00	0.00	0.00	1.43	1.68	3.43	30.80
1944	7.56	8.90	2.87	2.90	2.83	0.21	0.00	0.00	0.02	3.19	7.48	4.97	40.93
1945	3.82	6.05	7.02	0.53	1.53	0.00	0.00	0.00	0.00a	6.71	6.70	14.84	47.20
1946	2.49	4.06	1.89	0.10a	0.50	0.00	0.18	0.00	0.07	0.14	5.23	3.29	17.95
1947	0.96	5.54	7.94	0.12	0.68	1.92	0.00	0.00	0.00	6.54	1.06	2.11	26.87
1948	3.75	1.55	6.43	12.93	1.23	0.42	0.00	0.00	0.09	1.03	1.69	4.93	34.05
1949	1.81	4.61	13.38	0.04	0.37	0.00	0.18	0.00	0.00	0.07	2.48	2.87	25.81
1950	10.49	8.49	2.98	1.75	0.69	0.28	0.00	0.00	0.00	6.04	8.13	10.73	49.58
1951	6.20	3.86	1.23	1.33	2.55	0.00	0.00	0.00	0.01	2.76	8.82	13.69	40.45

1994	4.39	7.58	0.68	2.43	0.98	0.00	0.00	0.00	0.00	0.98	9.54	5.36	31.94
1995	29.90	0.36	20.01	3.31	1.54	0.38	0.00	0.00	0.00	0.03	0.40	12.63	68.56
1996	9.97	14.14	3.23	3.34	3.12	0.00	0.00	0.00	0.02	2.29	4.68	17.21	58.00
1997	14.43	0.43	2.46	1.01	0.80	0.59	0.00	1.05	0.40	1.26	11.59	4.09	38.11
1998	15.38	25.41	4.61	3.21	7.52	0.03	0.00	0.00	0.09a	1.37	8.88	1.62	68.12
1999	0.00z	12.88	6.62	2.31	0.04	0.06	0.00	0.00	0.07	1.19	6.98	0.99	31.14
2000	9.61	14.58	3.15	3.09a	1.83	0.26	0.00	0.00z	0.13	3.44	1.25	1.12	38.46
2001	7.97	9.77	2.94	1.40	0.00	0.04	0.00	0.00	0.21	3.03	10.44a	12.83	48.63
2002	3.08	1.80	3.46b	0.51	1.58	0.00	0.00	0.00	0.00	0.00	5.16	25.21	40.80
2003	6.50	2.80a	4.84	6.55	1.19	0.00	0.04	0.00	0.01a	0.00z	4.06a	18.81	44.80
2004	5.75	12.82a	1.79	1.55	0.08	0.00	0.00	0.00	0.05	4.30	2.14	13.38	41.86
2005	6.88	5.42	8.49	2.72	9.54	1.39	0.00	0.00	0.00	1.43	3.36	19.96	59.19
2006	7.66	5.93	13.47a	8.92	0.55	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	36.53

Period of Record Statistics

MEAN	8.92	7.40	5.55	2.68	1.10	0.31	0.04	0.13	0.38	2.23	5.33	8.21	42.14
S.D.	5.89	5.84	4.37	2.48	1.67	0.54	0.20	0.45	0.88	2.16	4.54	6.14	14.53
SKEW	0.91	0.99	1.41	1.50	3.02	2.01	7.94	4.95	3.22	1.52	1.09	0.75	0.83
MAX	29.90	25.41	20.34	12.93	9.54	2.17	1.71	3.17	4.52	10.83	21.20	25.21	96.25
MIN	0.41	0.10	0.07	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.67
NO YRS	75	76	76	76	76	75	75	74	75	74	75	75	72

http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?caheal+nca

NOTE: Prepare a separate demand table for each point of interest and POD under "Case A" and "Case B".

APPENDIX F of WAA
Demand above POD

Case B

Water Right ID	Source	Direct Diversion Rate (cfs)	Direct Diversion Season	Adjusted Direct Diversion Amount Oct. 1-Mar. 31 (af)*	Face Value Storage Amount (af)	Storage Season	Adjusted Storage Amount Oct. 1-Mar. 31 (af)*	Cumulative Adjusted Diversion Amount Oct. 1-Mar. 31 (af)	Purpose of Use Code**
None (N/A)									
Totals:	0	0							

* Place footnotes explaining adjustments here.
**B-Mining, C-Milling, D-Domestic, E-Fire Protection, G-Dust Control, H-Fish Culture, I-Irrigation, J-Industrial, K-Incidental Power, L-Heat Protection, M-Municipal,
N-Frost Protection, P-Power, R-Recreational, S-Stockwatering, T-Snow Making, W-Fish and Wildlife Protection and/or Enhancement, Z-Other.

Bosworth Sedimentation Pond

Construction Notes and Final Report

January 2000

MIKE WOODALL
VINEYARD LAYOUT SERVICES
GEYSERVILLE, CA

Site conditions

Pond dike is constructed in gently sloping drainage channel with moderately steep side slopes. The drainage channel at the dike location collects approximately 13 acres of watershed, including the northwest portion of a proposed vineyard.

Soils are mostly clays with small pockets of fractured rock. Spring flows appeared at the bottom of the pond during construction, along the original stream channel and trended slightly up the south slope of the pond wall. Spring flows accumulated approximately six inches of water in the pond in a few days.

Construction notes

- Keyway was excavated and inspected on December 9, 1999 by my associate, Mr. Ron Chappell, RCE, and myself. It was determined keyway excavated 10 feet was adequate, and soil/rock formations were suitable for supporting dike construction.
- Excavating the north slope of the drainage channel and a small portion of the channel's southern slope generated fill material.
- Construction was done using D8 Cat to cut and feed material to another D8 Cat towing a 5X5 sheep's foot for soil compaction. No water was added to soils as recent rainfall had adjusted soil water content to near perfect conditions.
- ASTM compaction tests were not taken on the fill, however, based on daily job site inspections, soils were consistently placed well above the 90% relative compaction requirement.
- A rocky soil zone, encountered mid way up the south slope of the pond wall, below the spillway, was excavated and backfilled with clays.
- The constructed dike is much more conservative than design. Design called for 15-foot dike width 2:1 side slopes. Constructed was 20-foot dike width pond side slope constructed at 2.5:1.

Drainage

A 24 inch corrugated poly pipe with smoothed wall liner installed approximately 2 ½ feet below the top of dike controls drainage overflow. The pipe penetrates the dike to daylight and is then down spouted to beyond the tow of the dike fill. Design calls for 90° elbow to be installed at the outlet as an energy dissipater.

The pond is designed to overflow the saddle to the south side of the pond. At this point, water level is at the top of the 24-inch pipe and six inches below the top of dike. However, an elevation check of the saddle after construction of the dike revealed the saddle is now four inches below its original elevation. It is recommended the saddle be restored to its original elevation with compacted fill to increase pond overflow capacity.

Close attention must be given to the backfill of the 24" CPP overflow culvert. The backfill was not compacted and settlement of the pipe trench should be expected as saturation occurs. Occasional wheel rolling of the trench is recommended. Replace soil in wheel rolled depressions to prevent ponding of drainage on the trench. Also, when the pond water level approaches the overflow pipe, observe and insure drainage does not leak around the pipe and migrate through the pipe trench. Seal if necessary.

Erosion control

All slopes were track walked, seeded and strawed immediately after construction.

Miscellaneous notes:

- Earthwork 6,000 cubic yards cut/fill
- Pond capacity at pipe overflow is 372,480 cubic feet, 2,786,173 gallons, or 8.55 acre-feet of water storage.
- Drainage area above pond ~ 13 acres.
- Estimated rainfall amount to fill pond to capacity – 19 inches